When will markets saturate? - An outlook on FCR and aFRR

Strommarkttreffen, 05.07.2024
Aurora provides market leading forecasts & data-driven intelligence for the global energy transition

- Power markets
- Renewables & PPAs
- Storage
- Grid & Congestion
- Electric vehicles
- Hydrogen
- Carbon
- Natural gas

Regular detailed coverage
Analytics on demand

14 offices and two more coming soon
600+ market experts
850+ subscribing companies
150+ transactions supported in 2023

Source: Aurora Energy Research
The balancing market prices were very volatile in the last years – especially on the aFRR markets we can see an increasing seasonal pattern.

Historical FCR Settlement Capacity Prices in Germany\(^1\)
€/MW/h, nominal

![Historical FCR Settlement Capacity Prices in Germany](image1)

Historical aFRR capacity prices in Germany\(^1\)
€/MW/h, nominal

![Historical aFRR capacity prices in Germany](image2)

1) Includes prices until the 25\(^{th}\) of May 2024.

Sources: Aurora Energy Research, ENTSO-E, Regelleistung.net
Hydro is the dominating technology that is prequalified for FCR and aFRR, however, the capacity of prequalified batteries is increasing quickly.

Sources: Aurora Energy Research, Regelleistung.net
While the thermal capacities that provide balancing services decrease, an increasing share of batteries enter the market - now also for aFRR

Sources: Aurora Energy Research, Regelleistung.net
Few thermal plants running and high opportunity costs for storage leads to a “reverse duck curve” on the balancing markets.

Sources: Aurora Energy Research, Regelleistung.net, ENTSO-E
With batteries dominating the FCR market, the prices will be increasingly coupled to the wholesale price volatility.

Composition of the FCR bid of a battery - Illustrative Example

€/MW/h, nominal

Several factors increase the complexity of calculating the reasonable FCR bid:

- State-of-Charge management during the day
- 4h blocks do not match the optimal spread times
- Quantifying the upside through Intraday trading during FCR provision
- Opportunity costs on other markets, like aFRR and Day-Ahead
- Different bidding behaviour of batteries with different duration or state-of-health

Sources: Aurora Energy Research, Regelleistung.net, ENTSO-E
Key take-aways

1. The composition of the FCR and aFRR markets will change fundamentally. The role of thermal assets will decrease and the markets will become increasingly dominated by batteries and renewable assets.

2. In the short term, less thermal generation and high opportunity costs for hydro and batteries will increase prices during summer days.

3. In the medium term, batteries will saturate the markets, setting the price based on their opportunity costs in other markets. This will decrease prices and interlink them to the volatility of the wholesale markets.

4. In the medium to long term, more and more renewable capacity will prequalify for FCR and aFRR capacity and with an especially strong impact on aFRR capacity down prices.

Source: Aurora Energy Research